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coke is almost entirely free from volatile or bituminous matters, being less puffy than ordinary coke, but less compact than anthracite. In the vicinity of the coal-seams are dikes of trap-rock. One hundred and twenty feet below the surface there is a bed of trap-rock, twenty-five feet in thickness; below this is a clay-slate, almost vitrified, commonly called "basalt," which has assumed a columnar crystallization; below this are alternating beds of sandstones and slates. Then, at the depth of sixty feet below the trap, there are ten or twelve feet of this coke, having occasional traces of vegetable remains, and at the bottom of the bed having a small amount of bituminous matter. Twenty feet below this is a half-coky coal, and fifteen feet below this, the ordinary bituminous coal of the country. These strata plainly indicate the graduation and diminution of the heating action in a downward direction. It is very curious, that in the beds of carboniferous slate above the trap there is no indication of this metamorphic action; there are even seams of coal above it; the veins of injected material must have been thrown up from beneath, the heating action extending from the interposed trap in a downward direction. This series of strata is therefore interesting, as proving that there were periods of igneous activity during the deposition of these formations.

Three hundred and ninety-eighth meeting.

April 11, 1854. — SEMI-MONTHLY MEETING.

The PRESIDENT in the chair.

Professor Lovering exhibited a model of an instrument for producing great velocities in experimental physics, particularly in optics. The motion is produced by a spring acting upon a train of wheels, and may be very suddenly diminished or increased by friction. With it were performed several experiments by the rapid revolution of variously painted cards; as of mixing the prismatic colors, and any two complementary tints or colors to form white. The instrument is of practical use to painters in mixing colors, as the effect of mixing any two colors may be at once seen. Dove, of Berlin, has used this instrument in showing that, when the eye has rested for a certain time on a bright color and then is turned to a white surface, the retina becomes partly insensible to the first color and feels more strongly its complementary color. These experiments were also shown.

Dr. Hayes exhibited some of the juice of the India-rubber tree, preserved from decomposition by a patent process. By the addition of a weak alkali to the recent juice, a substance prone to acetous fermentation is so changed that the formation of acid is prevented. This has led to many new applications of this useful substance. He exhibited specimens of perfectly pure India-rubber obtained from this milky juice; the consistence of the latter is between that of milk and cream; it yields from 48 to 52 per cent. of solid India-rubber. What he wished particularly to draw the attention of the Academy to was the fact, that this substance, in its normal state, is perfectly transparent; it is curious that from this entirely opaque fluid a transparent India-rubber should be obtained by simple desiccation. He exhibited a glass vessel coated inside and outside with this material, which did not in the least diminish the transparency of the glass, and was recognizable only by the touch; he had found that a considerable number of coatings did not diminish the transparency.

Dr. Kneeland read an abstract of the views of Messrs. Nott and Gliddon, as given in a work just published, entitled "Types of Mankind," in which the strongest arguments are given in favor of the theory of the original diversity of the human races; based in a great measure on the proofs derived from the Egyptian monuments, that at least four human races have remained distinct in and around the valley of the Nile from ages anterior to 3,500 years B. C., and consequently long anterior to any alphabetic chronicles, sacred or profane; the first part of the book ending with the conclusion "that there exists a *genus* HOMO embracing many primordial types or 'species.' " The second and third parts of the work are upon those portions of Scripture which bear upon the origin of mankind.

Dr. A. A. Gould alluded to the alleged fossil human bones from the upper part of Florida, and expressed the opinion of himself, and others who had examined the localities, that they had no claim to be considered as fossil bones.

The Corresponding Secretary read a letter from the Geological Society of London, acknowledging the reception of Vol. V. Part. I. of the Academy's Memoirs. Also letters from the Verein für Vaterlaendische Naturkunde, at Würtemberg, and the Société des Sciences Naturelles de Cherbourg, requesting an exchange of publications with the Academy; the latter Society had already sent one volume of its publications, in octavo.

Three hundred and ninety-ninth meeting.

April 25, 1854. — SEMI-MONTHLY MEETING.

The PRESIDENT in the chair.

Letters were read from the Ethnological Society of London, Rear-Admiral Smyth, and the Breslau Akademie der Naturforscher, acknowledging the reception of Vol. V. Part I. of the Academy's Memoirs; letters from the K. K. Geologische Reichsanstalt of Vienna, and the Académie Royale des Sciences de Stockholm, acknowledging the reception, the former of Vol. IV. Part. II., and the latter of Vol. V. Part I. of the Academy's Memoirs, and transmitting also donations of their publications in exchange; and letters from the Royal Institution of London, the Akademie der Wissenschaften of Vienna, and the Royal Danish Academy of Sciences of Copenhagen, presenting their publications.

Professor Horsford presented the following paper, offered to the Academy at a former meeting, and since revised and modified, "On the Value of the different Kinds of Prepared Vegetable Food," by John Dean.